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"THE SULPHONAMIDES, ANTIBIOTICS AND THE BOTTLE OF MEDICINE" *

I : The Sulphonamides

BY

J. CARMICHAEL

Introduction.—In a discussion dealing with the sulphonamides, the antibiotics and the bottle of medicine, I am sure you will not wish me to make comparisons because there is ample room for all three in Veterinary Medicine. I think, if there be any criticism of the title, the bottle of medicine should have been mentioned first, for assuredly it was in use long before sulphonamides or the antibiotics were thought of, but perhaps they sound more euphonious as they are. It is not possible in the time at my disposal to make anything but a brief summary of this group of drugs and I will therefore confine myself to a few headings.

HISTORY

To me there is always more than a glimmer of romance attached to the discovery of such an important and life-saving group of drugs when one considers what a radical change has come about within a decade in the treatment of many common but serious diseases of man and animals. I think the tendency these days is to take too much for granted and to forget that this great change in chemotherapy has happened within a very few years.

Although sulphanilamide was synthesised as far back as 1908, the therapeutic possibilities of this group were not suspected until the discovery of sulphonamido-chrysoidin and the demonstration by Domagk, in 1935, that this compound, and also a soluble derivative of it—azosulphamide—could protect mice against a fatal infection with B. haemolytic streptococci. This was followed by the work in France under the direction of Furneau in 1936, which demonstrated the antistreptococcal action of the simple substance sulphanilamide and it was postulated that the action of sulphonamido-chrysoidin was due to its conversion in the animal body to free sulphanilamide. Although this was a great discovery, it was soon realised that sulphanilamide had limitations in the field of activity and this led to the development of newer derivatives. The first of these was sulphapyridine, or M. & B. 693, in 1938, discovered by research chemists under Dr. A. J. Ewins. This was the first important group of heterocyclic derivatives of sulphanilamide. The new compounds possessed considerably greater activity on a number of organisms. The first published report, in 1938, was by Whitby, who pointed out its high activity against the pneumococcus. Sulphathiazole followed, and since then numerous further compounds which time will not allow me to elaborate. At this stage, however, I should just mention a new development which resulted in sulphaguanidine. Owing to it being but sparingly absorbed from the intestine it exerted its activity on organisms present in the bowel. More recently, succinyl sulphathiazole and phthalyl sulphathiazole have been added to this so-called gut-active group.

PHARMACOLOGY

Except for this latter group the sulphonamides are generally rapidly absorbed from the stomach and the small intestine and perhaps slightly from the large intestine. In the liver, except in the dog, a proportion of the free sulphonamide undergoes acetylation, forming a compound therapeutically inert. The free and the inactive acetyl portions are excreted through the kidneys, and can readily be detected in the urine. The rate of elimination varies with different drugs, sulphathiazole being one of the most rapidly excreted. The study of the distribution of the sulphonamides in the body and their excretion has been greatly facilitated by the use of relatively simple methods for quantitative chemical estimation of the drugs in body fluids and tissues. Much of the original work on the methods of estimation was done by Marshall and his colleagues at the Johns Hopkins Hospital, Baltimore, about 1940. Blood levels of the different sulphonamides and their rate of excretion vary in different animals and a very useful summary was given by Francis (1947).

In this paper blood level curves areas are shown for the sulphonamides for animals and man. The animals treated were the dog, cat, sheep, pig, cow, calf, horse and mouse. The drugs tested were sulphanilamide, sulphadiazine, sulphathiazole, sulphamerazine, sulphapyridine and sulphamethazine. It is clear that when dosage is related to body-weight there are considerable differences between the different animal species and that in comparison with man, animals require relatively higher doses to produce equivalent blood levels. In addition, at least in the bovine, age is another factor causing variation—calves showing lower blood levels than adult cattle. The general conclusion that can be drawn from all the published work on this part of the subject is that sulphamerazine and sulphamethazine give the best blood levels in most animals ; the former is more slowly excreted but is less rapidly absorbed than sulphamethazine. Sulphadiazine and sulphapyridine come next and sulphathiazole last.

Whilst most reports refer to estimations of the drug in whole blood it is probable that the important concentration is that in direct contact with the organisms, which in most cases are extra-vascular. They may be in the intercellular lymph spaces, synovial fluid, peritoneal fluid, cerebrospinal fluid, etc. David (1943) suggested that the sulphonamide drugs were approximately equally diffusible into the cerebrospinal fluid but that the diffusible fraction of the various drugs in the blood differed. The diffusible fraction was not bound to the plasma protein.

MODE OF ACTION

The sulphonamides are essentially growth inhibitors and the primary action on bacteria is generally believed to be bacteriostatic rather than bacteriocidal. Woods and Fildes (1940) discovered that p. amino benzoic acid is an extremely potent sulphonamide antagonist and the theory was advanced that the sulphonamides interfere with the utilisation of the substrate, p. amino benzoic acid, in an anabolic reaction by competing with the latter for its enzyme. It is more likely,

* Three papers presented in opening discussion of these subjects at the meeting of the Central Division, B.V.A., held at the Royal Veterinary College, London, N.W.1, on December 6th, 1951.

however, that the sulphonamides inhibit cell division by primary inhibition of one or more oxidation reduction systems. Many other substances antagonise sulphonamides, such as certain proteins in blood and pus and some local anaesthetics such as procaine, which contains the p. benzoic acid nucleus. Low concentrations of the drug have been found actually to stimulate growth.

Activity

The *in vitro* activity of a range of sulphonamides was studied by Maclay and Slavin (1947). The organisms tested included numerous strains of streptococci ; those associated with mastitis and also haemolytic Group C, the common pyogenic streptococcus of horses, and Group G, the streptococcus commonly found in dogs ; *C. pyogenes*, staphylococcus, pasteurella, salmonella and some others.

They found that sulphanilamide was the least active drug and there was not much to choose between the others tested, which were sulphathiazole, sulphadiazine, sulphamerazine, sulphapyridine and sulphamethazine.

The sensitivity of the organisms varied with the strain used and the drug against which it was tested.

Generally speaking, most of the streptococci were sensitive except *Str. uberis*. *C. pyogenes* was sensitive *in vitro*, staphylococcus was resistant, whilst the Pasteurella strains were usually sensitive. Francis, Peters and Davis (1947) tested the sulphonamides in the mouse and in chick embryo against *Str. agalactiae* and found 4·4 diaminodiphenyl sulphone and sulphadiazine most active, followed closely by sulphapyridine and sulphamethazine.

These laboratory studies give us a general clue but the acid test comes when the sulphonamides are used clinically.

Specificity and Therapeutic Results

When using the sulphonamides it is necessary to give an initial loading dose to get an adequate blood level and then half or one-third of this for five or six days. In practice it is very difficult to type the organism responsible for a given clinical condition in animals. In hospital patients this is much easier and a vast amount of work has been done in this connection in human medicine, which enables a much more rational approach to be made when treating illnesses in man. Even experimentally, many diseases of the larger animals are difficult to reproduce—such as, for instance, infections with pasteurella which in natural cases can be most virulent, in addition to which the cost is often prohibitive. The result is that final testing of many of the drugs takes place in practice where controls cannot usually be set aside.

In coccidiosis of poultry, on the other hand, which is readily reproducible in the chick itself, there is no lack of data on treated and untreated infections. Considerable work, however, has been carried out in calf scours and calf pneumonia by Thorp (1943) when treatment with sulphapyridine, sulphathiazole and sulphadiazine was controlled by blood level estimations and bacteriological examinations.

The chemotherapy of calf pneumonia was also studied by Jones (1947). Ninety-five cases, including 22 untreated controls, were dealt with. Blood levels were estimated and various organisms, including *Past. septica*, *C. pyogenes*, *Staph. aureus*, streptococci and *E. coli* were isolated.

The general conclusion was that calf pneumonia responds well to all the sulphonamides except sulphanilamide. Calf scours responds well to the gut-active drug but also to the ordinary class of sulphonamide such as sulphapyridine, sulphamethazine, etc.

Calf diphtheria was investigated by Farquharson (1942) and 72 calves were treated with sulphapyridine most effectively.

Forman and others (1947) reported on the use of sulphonamides as a single injection specific treatment of foot rot in cattle. They referred to work covering 1,500 cases and concluded that sodium sulphapyridine given intravenously was the best treatment. The specificity of this treatment has been amply confirmed in this country, both with sulphapyridine sodium and sodium sulphamethazine.

The treatment of caecal coccidiosis in chicks provides one of the best examples of specificity of the sulphonamides —sulphamethazine sodium, soluthiazole and, more recently, sulphaquinoxaline given in the drinking water, are proved specifics.

Many enteritic conditions of animals respond well to the so-called gut-active group of which phthalyl sulphathiazole seems the most effective. There are many conditions of dogs and cats which respond well to the sulphonamides but where the bacterial aetiology is ill-defined and variable. The same applies to pigs. In horses many febrile infections, such as pneumonia, metritis, etc., are caused by the Group C haemolytic streptococcus and these respond well to the sulphonamides, including sulphanilamide.

It is impossible in a short survey to cover anything but a few general conditions but it does seem that much more bacteriological diagnostic work is necessary in many of the common febrile complaints in all domestic animals, especially cattle, so that a more rational approach to practical chemotherapy can be undertaken.

Generally speaking, the sulphonamides are well tolerated by the domestic animals and the choice in practice depends on activity and cheapness. This does not apply to the human subject where, apart from the tendency to crystal formation in the kidney tubules, side effects such as nausea and depression are important considerations.

On the following grounds, the efficacy of the sulphonamides in veterinary medicine can be summarised thus :—

(1) Specific and therefore rational therapy.

(2) Most of them are easily given by the mouth, so that dosing can be left to the owner.

(3) Generally well tolerated. They can be given with antibiotics and a bottle medicine if so desired.

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II : Antibiotics

BY

D. D. OGILVIE

As an old member of the Society, and one who has enjoyed many happy hours at its meetings, I readily accepted your secretary's kind invitation to say a few words on the qualities and properties of the antibiotics so far as they relate to the veterinary field—the more so when I saw my distinguished friends Dr. Carmichael and Professor Wooldridge were to appear, as it were, on the same bill.

To take part in an evening of dialectics—which occurs to me as a possibility—is an old delight of mine and nothing would please me more, but I should make it clear, if I may, that basically I do not consider that there is any conflict or even competition between the three branches of chemotherapy which are under discussion to-night, provided always, of course, that the right sulphonamides are selected and that one puts useful ingredients into the bottle of medicine. Science, through its energy and inventiveness, is continually complicating matters by producing greater and greater numbers of novel substances with powerful specific activities and one is more than a little sympathetic with the unhappy lot of the practitioner on whom the ultimate decision of what to use and when to use it must fall, but nevertheless all therapeutic aids must remain in essence complementary rather than competitive if they are properly employed. I became involved in penicillin and the antibiotic field as soon as I moved to Manchester in the early years of the war. Having, then, made my views apparent in this regard, I should perhaps also endeavour to make it clear how I came to be interested and involved in that field.

At one time, having escaped from the whirlwind of general practice, I was, as some of you may know, a carefree member of the staff of the Ministry of Agriculture. There I spent a happy life wandering about the byways of Surrey, making sure that the pressure valves of Aveling-Barford boilers blew off at the correct load, slitting up the odd pig, staring down the gullets of chickens or attending the obsequies at the foot-and-mouth rituals which at the moment look like occupying the attention and energy of my erstwhile colleagues over the festive season and beyond. As a relaxation and, as it were, by special invitation, I used to go in from time to time to the establishment known and endeared to all of us at Weybridge and, strange to relate, I developed there a taste for what is known as "the research world." Having arranged my liberation from the Ministry, I arrived in due course at the city of Manchester.

To that same city and, no doubt, on the same sort of rainy autumn afternoon, there had come only a short time before another and much more important visitor, a man from Oxford, none other than Howard Florey, now Sir Howard, and then the leader of a team of workers which, stimulated by the onset of the war, had begun an ambitious programme of research into new substances for wound treatment. This team had drawn up a list of all the materials about which there was any evidence at all of antibacterial activity, and high upon it they had placed for investigation the mould *penicillium notatum* and the bacterium *Pseudomonas pyocyaenia*.

You all know the story of the discovery of penicillin by Alexander Fleming and its development by Florey and his co-workers, and I will not bore you with it again, but I would like to stress—because it tends to be forgotten in some parts of the world—that this was a wholly British discovery, developed from the embryo stage wholly by British workers, and fundamentally of overwhelming importance, since it opened up completely new fields of endeavour from which have come and are coming a whole series of powerful new substances. When Florey came to Manchester he came to arrange for the first commercial scale manufacture of penicillin in the world and through his efforts and those of his colleagues this great drug began its wonderful career which even yet is not fully at its flower.

The earliest penicillin was made at Trafford Park, Manchester, and was produced on a hastily improvised plant, with the culture vessels some 60,000 milk bottles. These in themselves presented quite a problem since they necessitated individual washing and handling. Much of the process was unknown country, the work was laborious, the yields low and often disappointing, but it was with this material that the big scale proving tests were undertaken with the drug, so that when eventually it was taken to America—the war making it impossible for the necessary factories to be built here—it was already proved and a full-scale effort on it could be made without risk or hazard.

You know, too, the success which attended American production methods. Penicillin and penicillin production afford good examples of their energy and drive, their ability to overcome physical difficulties, their mechanical skill and ingenuity, and their capacity for handling assignments on the grand scale. From the mil': bottle plant which was my first contact with the penicillin field there blossomed out in what seemed to me to be an incredibly short space of time the industry of penicillin production with special X-ray mutants of the fungus, deep culture inoculation, great fermenters holding tens of thousands of gallons of liquor, and the hundred-and-one chemical tricks and mechanical gadgets which make up the modern plant.

The qualities and properties of penicillin are, of course, known to you all. The drug itself is a household name. It has been the subject of world-wide publicity, its discoverer and those associated with its development have been honoured and acclaimed ; but yet much remains to be done with it before the whole picture is unfolded.

It was realised, of course, at a very early stage that penicillin was probably only the first of many antibiotic substances and many workers felt that on the pattern of most fundamental discoveries, it would soon be superseded by more active and attractive materials. This feeling was shared in part even by Sir Alexander Fleming himself, the discoverer of the drug. I remember attending a meeting of the Pathological Society in London. I went in late while one of the papers, illustrated by lantern slides and relating to penicillin, was proceeding and stumbled to a seat in the half-darkness. When the paper had finished and we were awaiting the next one, the man next to me said "You know, it would be more than wonderful if penicillin were unique and the only substance in its class to show these effects." Shortly afterwards he excused himself and left, and I thought nothing very much about his remark until I was told that this was Fleming. I have many times recalled the remark because although other substances in the same field have been discovered, penicillin does in fact in many respects remain unique. Indeed, for a long time, despite quite intensive work, it stood alone as the one and only antibiotic known to man until the discovery of streptomycin by Waksman in 1944 made it certain that other useful antibiotics would be forthcoming.

The uniqueness of penicillin rests on the fact that it is still the only therapeutic substance of great and wide activity whose use is entirely uncomplicated by risks of toxicity. No other drug allows assessment of dosage on the simple basis of just using as much as is required to deal with the infective agent. Of no other drug can it be said that it is virtually immaterial to the treated subject whether eight or eight million units are employed.

Our knowledge of penicillin is now, of course, very extensive but some work with it still remains to be done. The salts and esters of penicillin, for example, still need full investigation. There may be among them compounds with valuable properties which will enhance certain activities of the drug or make its clinical use easier or more effective. And there is still a lot of investigation to be done in relation to the use of penicillin as a so-called growth stimulant in food supplements, a subject to which I shall refer later. Meanwhile, as an indication of the amount of research activity which is still proceeding, one need only cite the recent Danish work on

the dialkylaminoalkyl esters of penicillin, and the American development of the non-allergic one-ephenamine penicillin G. The Danish work, which has now been replicated in this country, is particularly interesting in that the dialkylamino esters appear to have a strong affinity for the lungs and seem to accumulate in this part of the body. They have the added advantage of being resistant to inactivation by penicillinase. With them it is possible to obtain high levels of penicillin in the bronchial secretions, an example possibly of aimed or, if you like, projected therapy.

When I was in America recently, Commercial Solvents Corporation told me about one-ephenamine penicillin G, whose development in the medical field they consider very important at the present time. This is because quite a number of human patients show allergic response to penicillin which responses, it is claimed, are avoided with this new compound. Over 2,000 cases have been treated with it with satisfactory results. In my experience, allergic reactions of the type encountered in man are rare indeed in animals, but nevertheless this development is of considerable comparative interest.

Penicillin, of course, great drug as it is, is of limited value in the veterinary field because most gram-positive organisms are of major importance only in equines and in the smaller pet animals, and it is against these only that penicillin can be expected to give worthwhile results.

Streptomycin, the first antibiotic to reach clinical use after the discovery of penicillin, was the result of outstanding work by Waksman, of Rutgers University in America. Streptomycin will without doubt come to be recognised as one of the milestones of chemotherapy since it is not only the first chemotherapeutic agent proved to be active against tuberculosis and the earliest effective antibiotic against gram-negative organisms, but it has sign-posted the way to great new antibiotic discoveries by directing attention to the actinomycetes as a fruitful field for exploration. In clinical usage, however, streptomycin has had a chequered history. Early in its career, although it was recognised as the only drug active against acute disseminated tuberculosis, its clinical use had almost completely to be discontinued. This was because it proved toxic to the nervous system, especially the eighth cranial nerve which supplies the balance organs, and because the use of smaller doses to avoid these toxic effects quickly gave rise to drug-resistant organisms. By various strategems, however, particularly the concurrent use of para-aminosalicylic acid and the thiosemicarbazones, it has survived and it remains first choice in human tuberculosis. It has, however, little hope of usage in this direction in veterinary practice where only a virtually 100 per cent. effective compound could be employed.

In America, where streptomycin has been available to the veterinary profession for the longest time, it is perhaps significant that, apart from a few specific uses, it is not very widely employed. These specific uses are mainly in connection with bovine mastitis, infectious sinusitis in turkeys, and infectious rhinitis in swine. In bovine mastitis I found that a high proportion of medicaments for insertion into the bovine udder contained streptomycin as well as penicillin, but I could discover little or no unequivocal evidence that the presence of streptomycin greatly improved the results obtained. Indeed, in the States, the tendency in mastitis treatment seemed to be to move more and more towards poly-pharmacy. When penicillin, streptomycin, aureomycin, and "sulphamezathine" are all put into the udder at one and the same time it is more than a little difficult to ascertain which, if any, of the compounds is responsible for the beneficial effect.

Against *Actinomyces bovis* in man spectacular results have been obtained with streptomycin, and one awaits with interest the results of tests in animals against this organism and also against *Actinobacillus lignièresi*. One would also like to see a follow-up of the preliminary results with streptomycin against Johne's disease and against *Vibrio foetus* infection. Both of these infections respond well *in vitro* but there is already some evidence that, as in the case of 4 : 4-diaminodiphenyl sulphone, clinical cases of Johne's disease tend to relapse after an excellent initial response.

Streptomycin fermentation has the property of producing considerable quantities of the cobalt complex known as vitamin B_{12}, which I shall mention again later.

Three other antibiotics, all American discoveries and of outstanding merit, now require consideration. I shall deal with them briefly because of limitations of time and because their veterinary uses are only now being worked out. Naturally, however, they are main topics of conversation among American veterinarians and their usage there is expanding very rapidly. The products are, of course, aureomycin, chloromycetin and terramycin.

Aureomycin was discovered by Duggar in 1947 and is claimed to be the most versatile of the antibiotics yet produced. It certainly has a wide spectrum of activity, ranging through both gram-positive and gram-negative bacteria, some of the rickettsias and larger viruses, and possibly some protozoan organisms. Its toxicity is low and it has the advantage that, so far as is known, bacteria are unable to elaborate a protective antagonist against it such as penicillinase against penicillin. Moreover, little or no trouble has yet been encountered with allergy in relation to it. Unlike penicillin, it can be given easily by mouth except in ruminants, where it interferes with the activity of the ruminal flora, although it is satisfactory in calves if employed before the rumen develops. It can be given by intravenous injection and, indeed, this is the mode of administration most favoured by American veterinarians for equines and bovines. For smaller animals capsules are usually employed and are given by mouth. Aureomycin has been shown to be active against a number of fungus infections and good results are being claimed in various skin conditions in dogs and cats where its breadth of activity makes it of especial value in cases of mixed infection. Ointments containing about 25 mg. of the drug per gramme are indicated. For the treatment of bovine mastitis, aureomycin is being employed in America and elsewhere as a stronger ointment containing about 60 mg. per gramme. About 7 grammes of this ointment is used per quarter of the udder. I formed the impression in America that results following this line of treatment had been a little disappointing. In the States, too, I received information from the Lederle Laboratories of American Cyanamid, who have developed aureomycin, that excellent results are forthcoming from the use of aureomycin hydrochloride "oblets" in the treatment of bovine metritis. These "oblets" contain 500 mg. of the drug and they are inserted directly into the uterus. This work follows the interesting observation made recently that aureomycin is active against *Trichomonas foetus* and one looks forward to seeing the results of field tests in this connection.

Chloromycetin, or chloramphenicol, was discovered in 1947 in the Parke-Davis Laboratories by Ehrlich and co-workers and is notable among antibiotics in that through the work of Crooks and his associates it became the first and, to date, the only antibiotic to be synthesised successfully by commercially practicable methods. At first the field for chloromycetin appeared closely to follow that of aureomycin. It is active against gram-negative as well as gram-positive organisms, it deals effectively with some of the rickettsias and

larger viruses and it has many of the other properties of that drug. Wide clinical use in man, however, has indicated specific uses outside those of other antibiotics, especially in relation to salmonella, shigella, and proteus organisms. In man its use is well established in undulant fever, typhoid fever, salmonella dysentery, various types of pneumonia, Rocky Mountain spotted fever, scrub typhus, typhus fever, and several virus or virus-like infections such as herpes. In animals it is known from the experimental work which has been done by Parke-Davis and others that the drug is well tolerated and is of low toxicity. Gruhzit and his associates have shown that daily oral doses of 200 mg. per kg. for four months had no ill-effects on dogs. But, so far, most of the work has been concentrated on the human side and veterinary developments on a large scale have yet to take place. That chloromycetin will have a place in the veterinary field seems without doubt. Small-scale usage of it, for example, in ear infections in dogs, appears already to bear this out.

Terramycin, the third of the new antibiotic family and the latest to be accepted for wide-scale usage, was discovered in the Charles Pfizer Laboratories by Finlay and co-workers early in 1950. Like aureomycin and chloromycetin, it has a wide spectrum of activity and in the veterinary field it is already well established in America, especially for small-animal use. It is employed either by mouth or by intravenous injection or by local application. For dogs and cats tests by a number of veterinarians in the States have shown that it is indicated in virtually all the common infectious conditions, including the secondary bacterial complications of distemper and feline panleukopoenia, and urinary infections such as cystitis and nephritis. Cromley and Hagley have recently described very successful results in shipping fever and pneumonia of cattle and there is little doubt that the drug, if generally available, would be of considerable value in the veterinary field. In ophthalmic work in dogs it is particularly promising. Cases of melanotic keratitis, acute iritis and severe conjunctivitis when treated with it have cleared up very rapidly. Recently, an intramammary ointment of terramycin has been made available in the U.S.A., using the same dosage as with aureomycin, but it is too early as yet to assess its effectiveness. A few trials against staphylococcal mastitis did not show much in the way of advantage over other substances.

As with the other antibiotics, many infections in animals respond well to terramycin, but not all. For example, certain types of septicaemia of calves arising from umbilical infection have been found refractory and much work remains to be done to determine just what diseases can be dealt with by these new products under practical conditions.

Since 1950 a new and engrossing development has been taking place in the veterinary antibiotic field about which all of you have heard but which, unfortunately, has been the subject of many misleading reports. I refer, of course, to the use of antibiotics as so-called growth stimulants or growth accelerators. It is unfortunate, I think, that more of these reports have been given to the public through the medium of the popular farming and poultry Press than have been given to the profession, and this may be one of the reasons why confusion has arisen. Without going into too much detail it is possible to express the facts quite simply. Work in America during the war showed that when pigs and poultry were fed an all-vegetable protein ration they failed to thrive, although ruminants did so. When a small quantity of animal protein was added to the ration they did well and no difficulties arose. The difference between the pigs and poultry and the ruminants was that the last named could synthesise the substance contained in animal protein whereas the others could not. This synthesis was done by bacterial fermentation. The substance involved was later found to be vitamin B_{12}. Examination of streptomycin residues showed that they were rich in B_{12} and they were regarded, therefore, as suitable substances for fortification of all-vegetable protein diets for pigs and poultry. Critical tests showed, however, that streptomycin residue fortified diets gave greater weight gains than those in which the B_{12} was supplied in crystalline form. It was realised, therefore, as had already been noted by Moore and his co-workers in 1946, that there was an additional growth response from feeding the antibiotic. The observations were rapidly extended by Catron and other American workers to aureomycin, terramycin and other antibiotics. All of them did not give the same degree of response and some of them gave no response at all, but widespread and detailed work, some of which has been or is being repeated in this country, indicated that quite dramatic results could be obtained by feeding aureomycin or terramycin with diets adequate in B_{12}. Streptomycin, except as a source of B_{12}, dropped out of the picture at a fairly early stage since it was shown that very large amounts of it were required to give the same results as these other substances. In all of this work penicillin, not being associated with the B_{12} story, took no part and it was not until 1950 that Whitehall and his associates demonstrated a growth-promoting effect with it in chicks. Later that year Hogan and co-workers found a similar effect in pigs and showed that growth rate was accelerated as much as 18 per cent. and up to 11 per cent. of feed saved per unit of gain. Critical examination of these somewhat startling findings by Catron and others revealed that in pigs penicillin was almost equi-active in clinical effect to aureomycin and terramycin and that in poultry it was more active than they. On a weight-for-weight basis two parts of procaine penicillin are equivalent in this regard to about five parts of aureomycin or terramycin hydrochloride. In the United States considerable medication of pig and poultry feeds is now taking place and field results are very satisfactory. I saw much of the work which had been done in this field by veterinary and other workers and was very impressed. It has been undertaken on a very big scale by competent people and there seems to be little doubt as to its validity. The mechanism involved and many other points are obviously fruitful subjects for debate and experimentation. Many points at first obscure have already been cleared up but it will obviously be some time before proof of various theories of effect is forthcoming. Meanwhile, the U.S. livestock industry appears to be reaping the benefit of what is claimed on all sides in America as the greatest nutritional advance of recent years.

In this brief talk I have not mentioned the many other antibiotics which have been discovered, some of which are actually in clinical use. Their numbers are considerable —streptothricin, polymixin, nisin, bacitracin, neomycin, just to name a few—but their uses so far have been limited and they hardly compare in importance with the big five which at present hold the stage.

The vast amount of research and effort which is now being put into the search for new antibiotics may not be fully appreciated by everyone. The fact, however, that 45 per cent. of all prescriptions in the United States now specify antibiotics has ensured that major efforts are and will be continued. But the work is slow, painstaking and expensive. It is based very largely on the examination of soil samples from all over the world and less than 1 per cent. of samples provide moulds of any interest. Even when elaborate tests of effect and suitability have been performed on these, nearly all of them are rejected on grounds of toxicity or for some other reason. Already some 150 antibiotics have gone far

enough to be given separate names and tested comprehensively but only a handful have survived. The search, therefore, is a difficult and tedious one where big resources and plenty of manpower are needed. Mathematical chances at present favour those who can provide these on the most generous scale. In this regard, no doubt, our American friends are best situated. Who knows, however : given luck, good guidance, and continuing energy, we may yet produce another penicillin.

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III : "The Bottle of Medicine" (!!)

BY

G. H. WOOLDRIDGE

After listening to two highly scientific dissertations, we now descend to more mundane matters. I really wonder if the members of the Committee had their tongues in their cheeks when they decided on the title of the discussion for this evening !

I know it has been the accepted thing for many years for the cynic and the ultra-sophisticated to scoff at the very idea of "a bottle of medicine." I have known surgeons of repute and skill laugh quite heartily at any suggested line of treatment that was not connected with their own particular plumbing activities. I suppose their approach to "a bottle of medicine" was based on ancient history of the old witch doctors who gained a living and reputation by the dispensing of their wonderful charms and love potions. And who shall say that their love potions were all spoof ? I suspect that some of them had a fairly wide, and not altogether unfounded knowledge of the effects of the administration of aphrodisiacs.

But the contents of these "bottles of magic" were always mysterious, and human beings have always worshipped the mysterious until the mystery has been exploded or explained. Unfortunately, the same blind faith still exists in the minds of many uneducated people and, I regret to say, in the minds of very many people who are credited with being educated.

Obviously, the individuals who dispensed these various potions and draughts were in the main fraudulent charlatans, but not all of them. Some of them were honest men and keen observers. They carefully watched and observed the effects produced by the agents they had prescribed, and if they appeared to relieve the patient they were able to repeat them, or to avoid them if the reverse were the case., And so, I assume, a more or less rational system of medication developed. So-called medicinal agents increased in numbers until we arrived at the stage when the leech and the cow-leech became surrounded in their dens or consulting rooms with almost innumerable packets, drawers and bottles of agents, some of which I give them credit for honestly believing in ; others they just hoped might be helpful because they had been handed down from previous generations : and how attractive they were made to look in those large flagons of beautifully coloured solutions !

One wonders how many patients were actually "doctored to death" by these means. I believe that a common custom was to walk around the room and put a little from most drawers and packets into the bottle for the benefit of the poor patient. It may be that this multiplicity was fortunate, for I can well believe that about one half of the agents may have been antidotal to the other half.

Even at a much later date the aura of mystery still clung to these medicines, and the doctor, when writing prescriptions, actually prefaced the ingredients with a symbol looking like a capital R with a stroke across the tail (℞), often interpreted as an abbreviation of "Recipe," implying "take of." I believe it was actually a sign of the Zodiac—♃—imploring the sympathetic assistance of Jupiter or Jove on behalf of the patient (a very timely prayer considering what might be included in the prescription).

I suggest that all this that I have said may be regarded as a grave indictment of "the bottle of medicine" and a complete justification of the attitude of the hardened cynic, but I do not propose to leave it at that. No ! I am going to attempt to justify "the bottle of medicine," remembering how often I myself and many of my friends have received much-needed sustenance and stimulation from a bottle.

When the physician—in human or in veterinary practice—is called in to see a patient his first step, I submit, is to assure himself that there is some departure from health, and apart from any history of the case he does this by the careful observation of symptoms, or alterations of function. By deduction based on his experience and his knowledge of normal functions and of physiology he will recognise what organs or tissues are not functioning properly, and further, from his knowledge of pathology, he will form an opinion as to the nature and find evidence of any change or damage that may have taken place in those organs and tissues that could have caused those alterations of function or which, on the other hand, could have been brought about as a result of such malfunction.

By this time the physician is well on his way to arriving at a diagnosis, but in order to complete it he must try to ascertain the primary cause of the trouble. If he is able to do so, then his diagnosis can be pretty definitely made and the steps he must take in the treatment of the patient become clear (though I am sorry to say by no means always successful).

And this brings us to treatment. We are at last getting nearer to the subject of our discussion, for sulphonamides, antibiotics and bottles of medicine are primarily used in treatment.

Treatment, as I see it, must be based on a series of principles, namely, the removal of the cause wherever possible, the relief of symptoms and restoration of functions, and the repair of the tissues and organs that have been more or less seriously damaged by primary or secondary causes.

It is in connection with the first of these principles—the removal of the cause—that we come at once in contact with sulphonamides and antibiotics, especially when the cause happens to be either bacterial or, in some cases, protozoan. Let me at once say that I consider the discovery of these two series of agents to be amongst the most outstanding discoveries of this century and I expect that this evening you have already been treated to a dissertation on their respective values up to the last minute, so to speak.

Their chief actions are the removal of the causes of a variety of specific diseases and this they do in a most spectacular manner in many cases, but this, so far as I can appreciate it, is where their activities usually end, and what a wonderful accomplishment that is !

But, having removed the cause of the trouble, there is a lot more to be done in the way of restoring functions that have been severely deranged, and in repairing more or less severely damaged tissues. These things are not accomplished automatically by the removal of the specific cause of the disease.

So it is that much continued trouble is caused by the presence of toxic matters and excessive waste products. Their presence is not only directly deleterious, but, so to speak, clogs up the machinery, and they must be got rid of through the various excretory channels. Hence the

immediate necessity for the bottle of medicine. Maybe the heart and general circulation are flagging and require assistance from some stimulant with a fairly rapid action such as alcohol, ammonia compounds, caffeine, etc. As these are usually transient in effect, however, they may need support from such agents as digitalis preparations and others with more durable effects and repeated at appropriate intervals. Again the bottle of medicine is called for. One could give a long list of appropriate examples to emphasise this theme, but surely that is unnecessary as the argument appears to be so obvious. I must here sound a serious note of warning against the indiscriminate use of these valuable agents. Their failure to produce the desired results when wrongly prescribed may readily give them an undeserved bad reputation and undermine one's confidence in remedies of great value.

There is, finally, a most important proviso in the choice of the contents of your bottle. It is no longer necessary to select agents by rule-of-thumb, or to look to the stars for guidance. The science of pharmacology has shown us very precisely what is the result on tissues and organs of introducing various agents into the body. We must make use of this knowledge and select those agents most likely by their actions to counter the ill-effects produced directly or indirectly by the primary cause of the illness. In this way one can definitely assist the *vis medicatrix naturae* and, what is equally important, avoid such medication as may retard those natural powers.

And so you will realise that I very strongly believe in the bottle of medicine, carefully selected as the result of one's knowledge of pharmacology and clinical experience, and its application to the treatment of conditions whose pathology we know something about, and to the restoration of functions, etc., in the more obscure cases.

Select your medicines with discrimination and discretion —mix your medicines with brains, and you will get results that cannot be obtained by any other means.

No ! You just can't do without your bottle of medicine ! !

. . . . .

During the course of the lengthy discussion which followed, Mr. Ogilvie, dealing with the dosage of antibiotics, said that, as to the dosage of penicillin in small animals, it was generally an economic question; they wanted to use slightly bigger doses per lb. weight in small animals than in big. A cat, for example, might be given not less than 5,000 units per lb. bodyweight, whereas in the horse the dose would be of the order of 2,000 units per lb. bodyweight. The snag with penicillin was that it soon reached the renal threshold and it was lost as quickly as they pumped it in. The dosage for chloromycetin was somewhere about 50 mg. for a cat; it was relatively non-toxic.

The use of streptomycin in antibiotic feeding was mainly for chickens and pigs. It was useful in the adult bovine, but in relation to the calf before the rumen was developed it had been shown that levels of about 40 mg. per lb. of food would give them an inhibition of most of the organisms associated with calf scour and resolution of clinical conditions. That work was being vigorously pursued in the States and they had had some effect with lower concentrations of aureomycin; as low as 5 mg. per lb. of food. While streptomycin would do the job he did not think it would ever come into general usage. The toxic effect was reversible, slowly reversible, and people who had been affected took a long time to recover.

Concluding with a reference to costs, Mr. Ogilvie said that the production of antibiotics was expensive and they were not manufactured until the public wanted them in a big way; it was too costly to do it in a small way. To-day penicillin was a cheap drug; the cost of 100,000 units would be about 3½d. and there were not many things that cost that price; that was because people used it. In the States at one time cortisone cost 45 dollars a gramme; it was now 17 dollars and soon it would be about 2 or 3 dollars; that was because the drug was used and big scale production was going on.

CLINICAL COMMUNICATION

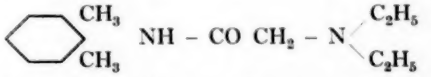
THE USE OF XYLOTOX AS A LOCAL ANAESTHETIC IN VETERINARY PRACTICE

L. GUY ANDERSON,
P. C. TUCKETT
AND
R. KENWORTHY

Xylotox was produced as a result of experiments with basic anilides originally carried out by Lofren and Lundquist in Sweden. It is, chemically :—

-w- diethylamino –2, 6–dimethylacetanilide

or, structurally :—



The advantages of this agent in human medicine, particularly in dentistry, have been referred to by Gruber (1950), Thexton, Wishart and Baxendine (1950), Goldberg (1944-47), Gordh (1948) and Hanson and Hingson (1950).

The general conclusion of these workers is that the new drug has great advantages over others of the same group, *viz.* :—

1. It is less irritating to tissues (solutions up to 8 per cent. are non-irritant to the conjunctival sac).
2. It is an efficient topical anaesthetic.
3. It is stable and does not decompose on boiling.
4. Security coefficient is two to four times higher than procaine.
5. Anaesthetic effects exceed those of procaine.
6. May be used with or without adrenaline.

In view of its proved efficiency in human anaesthesia, it was felt that this product would have a useful place in the veterinary field, particularly as local and regional anaesthesia are so frequently employed in cattle and other branches of practice. A generous supply was, therefore, obtained from the manufacturers, and the case reports set out below will give a clear picture of how it was used.

The original supply was in a 3 per cent. solution, but it was felt it might be well worth while trying it in a 2 per cent. solution, as this might reduce the cost. However, broadly speaking, we found very little difference in action between the 2 and 3 per cent. solutions.

From the case reports it will be seen that this product has the following advantages :—

1. Although very large doses were given epidurally in some cases, no toxic effects were noted.
2. The efficiency of the anaesthesia produced was markedly high.
3. The speed with which anaesthesia was produced was in some cases quite startling, and the anaesthetic appears to spread and absorb with incredible rapidity. We found that out of a total of 60 horns anaesthetised two horns " missed," but anaesthesia was induced with a second injection.

We could find no necessity to use rondase in conjunction with this product, and with our limited experience with the former we feel that xylotox alone is rather more efficient than procaine plus rondase, and that it has in fact (as noted by medical workers) all the advantages of this combination plus a very much greater rapidity of action.

XUM

Case Reports

Case 1. *Fractured Horn and Horn Core in Cross-bred Jersey Cow.*—5 c.c. of xylotox (veterinary) 3 per cent. solution were injected over the corneal nerves of both horns. This was the first occasion on which the drug was used, and as there were other things to do on the farm at the same time, about 10 minutes were given for development of anaesthesia. It was found to be complete and both horns were removed with only the lightest restraint.

Case 2. *Sixteen Guernsey Cows to be Dehorned.*—5 c.c. xylotox (veterinary) were injected into the usual sites. About half of these animals were done with 3 per cent. and the other half with 2 per cent. solution. The average time for anaesthesia to develop was from five to seven minutes, with little difference between the two solutions. These 16 animals were dehorned by one of us (R. K.), with one farm hand to assist, in about 1 hour 40 minutes, although conditions for restraint were not good.

Case 3. *Ovariectomy—Friesian Cow.*—In view of the immense size of the cyst in the left ovary (approximately that of a coco-nut), it was decided to do this operation through the left flank, rather than *per vaginam* ; 8 c.c. of 2 per cent. solution were injected intraspinally and anaesthesia of the tail and perineal region appeared complete in about three to four minutes. The left flank was then infiltrated with 3 per cent. solution, and the operation proceeded with in the usual way. This was a particularly fat animal and, finding that we had injected insufficient anaesthetic into the internal oblique muscle, a small quantity was injected into this after exposure. The operation was then proceeded with under extremely satisfactory anaesthesia. (We feel that the failure to anaesthetise the internal oblique muscle from the start was simply the fault of technique and using an insufficiently long needle in an animal with a very thick abdominal wall.) Healing was by first intention.

Case 4. *Amputation of Digit—Friesian Heifer.*—45 to 50 c.c. of 3 per cent. solution was injected intraspinally. The cow went down in about 8 to 10 minutes, and was laid on her affected side, but in a further five minutes there was still some slight reflex in the foot ; 15 c.c. of 3 per cent. solution were injected into the three usual sites for nerve block of the digit, and the operation proceeded with immediately on completion of these injections. Anaesthesia was complete.

Case 5. *Disbudding of Calves.*—Altogether some 12 calves have been anaesthetised with xylotox (veterinary) for disbudding. About 2½ c.c. were injected over each cornual nerve, and anaesthesia of the horn bud was complete within three to four minutes.

Case 6. *Dystokia Involving Embryotomy in Shorthorn Heifer.*—7 c.c. of 2 per cent. solution were injected epidurally. The tail became completely limp by the time the syringe had been set down, the needle withdrawn and the site swabbed. The peri-anal region appeared anaesthetised within three minutes and embryotomy was proceeded with in about four minutes, with no signs of straining on the part of the patient.

Case 7. *Further Dishorning.*—About 20 other cows have been dehorned using this anaesthetic. Results were uniformly satisfactory with anaesthesia well within five minutes in the great majority of cases.

We understand that this product is also useful as a topical anaesthetic, but unfortunately with the exception of Cases 8 and 9, we have had little opportunity as yet for using it in this connection.

Case 8. *Entropion Operation.*—Labrador puppy, aged six months, with very bad entropion of right eye. A few drops of xylotox (veterinary) 3 per cent. were dropped on to the surface of the eye and then about ½ c.c. by infiltration over the site of operation. The operation was proceeded with in the normal way. It is interesting to note, not only that anaesthesia, including that of the conjunctiva, was extremely satisfactory, but also that healing was complete and the presence of the drug in the tissues appeared to have no irritating effect which might have delayed healing.

Case 9. *Abdominal Wound of Cat.*—This cat had been operated on by caesarean section one week previously, but a few minutes after the skin sutures had been removed, although healing appeared satisfactory, the external wound reopened completely. A small quantity of xylotox (veterinary) was dropped on to the exposed surfaces and a very small quantity injected into the wound tissues. This produced complete and immediate anaesthesia and the effect of the surface application appeared to prevent any feeling while the injections were being given. The wound was then re-sutured in the normal way.

Acknowledgment.—We are grateful to Messrs. Willows Francis Pharmaceutical Products Ltd. for generous supplies of this product for clinical trial.

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Addendum.—Since preparing these notes, several other cases have been dealt with in large and small animals : removal of tumours, suturing accidental wound of horses, etc. Results have been uniformly satisfactory.

CANCER RESEARCH

Sir Daniel Davies, proposing the adoption of the annual report at the annual meeting of the British Empire Cancer Campaign, held on Thursday of last week, said that progress in cancer research continued. The new tools of the scientist made possible the more detailed study of the cancer cell. If the secret did not lie in the cell the development of microchemistry, cytochemistry, isotype tracers, and tissue cultures might provide more profitable knowledge.

Some improvement in results could confidently be expected even with the present weapons. Pre- and post-operative care improved each year. The control of infections that so often destroyed the good work of the surgeon had also developed greatly since the war. But until more specific treatment was discovered there was little chance of dramatic improvement unless earlier diagnoses were made. Earlier diagnosis depended largely on the patient.

The Duke of Gloucester, who presided, said that the campaign advanced apparently unhindered by economic storm. The relationship with Canada and the United States was being well maintained and the system of exchange fellowships was working smoothly. The Duke of Gloucester announced that the Queen had granted her patronage to the campaign.

Mr. J. C. Burleigh said that the campaign's income of nearly £260,000 during the past year from donations, collections, and legacies was over £34,000 more than the total for 1950. The campaign's expenditure of £237,430 on its main objects was over £63,000 more than for 1950. In addition, a sum of £40,000 was allocated to provide for additional fellowships.

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Weekly Wisdom

One of the many exasperations which beset that disappearing figure, the Man of Taste, is that as his means dwindle the price of covetable objects rises.—Times (book review).

ABSTRACTS

Nutritional Deficiencies*

For a period of six months during 1951 the author was able to visit various centres of agricultural research in the U.S.A. and some of the work that he saw in progress is reported briefly in this paper.

At Cornell University long-term trials are in progress with dairy stock reared on three different planes of nutrition, *viz.*, extra-well fed, normally fed and poorly fed ; the animals in the last group receive only 70 per cent. of normal energy requirements. A correlation has been established between the planes of nutrition in bull calves and the early production of semen of good quality. In heifers the average age of onset of oestrus was 280 days in the extra-well fed, 339 days in the normally fed and 572 in the poorly fed groups. O'Moore points out that on some of the poorer farms in Ireland calves are reared to maturity on diets that provide even less than 70 per cent. of normal requirements.

Antibiotic supplements are, of course, being widely employed in the feeding of pigs, poultry and young calves. It has been found that it is better to discontinue feeding such supplements to fattening pigs after they have attained 125 lb. liveweight, or there may result an excess deposition of fat. There have been some findings in Michigan which suggest that the prolonged feeding of antibiotics to pigs may interfere with vitamin D metabolism and hence with the absorption of calcium and phosphorus. In Iowa an atypical osteomalacia has also been reported in pigs given large amounts of aureomycin residue over long periods of time.

At Maryland University characteristic lesions are stated to have been demonstrated in experimental animals slaughtered during the course of an attack of ketosis. The single intramuscular injection of 1·5 grammes of cortisone is said to be effective in most cases in restoring a hypoglycaemic and hyperketonaemic cow to normal. At Ohio it has been observed that ketosis is more prevalent at that period of the year when roughages are poorest. When the dry matter of the feed falls below a ratio of 2 roughage : 1 concentrate there is alteration in the ruminal flora and a consequent change in the type of fermentation.

At Wisconsin it has been found that a cow's requirements for glycogen are met more satisfactorily by acetate than by glucose, and at Minnesota the use of sodium acetate in the treatment of ketosis has been found successful. Some affected cows will even ingest powdered sodium acetate.

A. N. W.

* **Nutritional Deficiencies.** O'Moore, L. B. (1952.) *Irish Vet. J.* **6.** 320-326.

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Puerperium of the Cow: Uterine Motility*

This study was carried out to investigate the changes occurring in the uterus of the cow *post-partum* and to assess the factors which favour retention of the foetal membranes. The frequency of uterine contractions was measured by means of an inflated rubber balloon inserted into the uterus and connected to a manometer. In 43 cows where the puerperium was normal it was noted that forceful contractions at first occurred regularly about every three minutes, the average pressure exerted being 20 mm. Hg., but by 24 hours the frequency was about nine contractions per hour. This rhythm was not affected by permitting the presence of the calf or allowing it to suckle the cow. In seven cows where abnormality, *e.g.*, retention of foetal membranes or milk fever, supervened, uterine contractions were feeble or absent, whereas following abortion they were frequent. The effect of pituitrin was to increase the force and frequency of contractions in the normal cow but the degree of its influence was much less in cases where the placenta was retained ; stilboestrol, progesterone, testosterone, ergometrine and acetylcholine did not influence uterine motility appreciably. The evidence generally supports the view that retention of the foetal membranes is associated with reduced uterine motility within 24 hours of calving.

S. J. E.

* **The Puerperium of the Cow. A Study of Uterine Motility.** Jordon, W. J. (1952.) *J. comp. Path.* **62.** 54.

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Scrapie in Sheep*

I.—The transmissibility of scrapie and the filtrability of the agent were suggested by French workers. To investigate the possibility that scrapie may be transmitted to sheep by pasture contaminated by scrapie sheep, infected and normal sheep were run alternately on two pastures without immediate contact over a period of nearly six years. More than three years elapsed before scrapie appeared in the normal sheep and in the following two years 10 cases occurred in 25 sheep. Some lambs of the contact sheep of this experiment were used for preparing louping-ill vaccine. The batch of vaccine from the tissues of these lambs, containing 0·35 per cent. formalin and stored for three months, produced scrapie in about 10 per cent. of some 18,000 sheep in which it was used. It was concluded that scrapie is caused by an infective agent resistant to formalin and storage, which can transmit the disease by subcutaneous inoculation after a prolonged incubation period (one to two years). The infective agent was present in transmissible form in sheep 15 months before they might have been expected to show symptoms. The importance of the disease merited further investigation, and for this purpose a flock of 780 was established.

II.—The authors demonstrate that the agent causing scrapie is filtrable and that it can be maintained by serial passage in sheep. Extract was prepared from brain and cord of three infected sheep and injected intracerebrally into 18 sheep of which four developed scrapie. Portions of extract were filtered through gradocol membranes of A.P.D. 0·65μ and 0·41μ and injected intracerebrally into sheep, 10 out of 36 becoming infected with the 0·65μ filtrate and 7 out of 29 with the 0·41μ filtrate. Lambs inoculated with filtrates of A.P.D. 0·2μ, 0·12μ and 0·055μ were unaffected within the observation period of one year. The incubation period averaged about six months, varying from 5 to 10 months. Symptoms were typical of the "itch type" of scrapie and the course was about two months. The agent was passed serially and discontinued at the ninth pass. At each pass some sheep developed scrapie, 17 cases being registered out of 33 sheep in the experiment. Dried agent stored at 0° to 4° remained viable for at least two and a half years. Histological findings, in agreement with previous workers, indicated a subacute or chronic meningo-encephalitis.

A. W. G.

* I.—**Scrapie in Sheep.** Russell Greig, J. (1950.) *J. comp. Path.* **60.** 263-266 ; II.—**Studies in Scrapie.** Wilson, D. R., Anderson, R. D., & Smith, W. (1950.) *Ibid.* **60.** 267-282.

REVIEW

["Popular Dogs: The Breeds, their Care and Management" By Phyllis Robson. (1952: Second Edition, enlarged and revised.) Pp. 285; 111 illustrations. Popular Dogs Publishing Co., Ltd., Hutchinson House, Stratford Place, W.1. Price 15s.]

This book is the work of an author who has had a life-long experience with dogs of all breeds. The breadth of her experience and her practical outlook are reflected in this volume which is one that members of the profession may confidently recommend to clients, whether novice dog owners or more experienced breeders. The subject matter is dealt with comprehensively, lucidly yet briefly; the section on common ailments has been contributed by a veterinary surgeon and the author thus escapes the criticism which is so often levelled at books of this type written entirely by laymen.

QUESTIONS IN PARLIAMENT

Foot-and-Mouth Disease

Mr. Renton (July 2nd) asked the Under-Secretary of State for Air whether he is aware that Royal Air Force personnel have, in recent weeks, been taking part in exercises which require them to walk over grass fields and farm roads for long distances in areas which are affected by foot-and-mouth disease; and whether he will cause these exercises to be postponed immediately until such time as the risk of spreading the disease has disappeared.

Mr. Ward: These exercises were held with the knowledge and consent of the Ministry of Agriculture. They would certainly have been cancelled if foot-and-mouth disease restrictions had been in force in the areas concerned and, indeed, several have been cancelled for this reason during the past few months.

Mr. Peart (July 3rd) asked the Minister of Agriculture what recommendations his Department has received from international bodies concerning the control of foot-and-mouth disease.

Sir T. Dugdale: The most recent recommendations, which were made at a meeting in Paris in May (and of which I am sending a copy to the hon. Member), were directed to countries which control foot-and-mouth disease by means of vaccination or slaughter combined with vaccination, and were designed to improve the effectiveness of these methods. They do not apply to this country. Earlier recommendations have been in favour of a slaughter policy in countries where the disease is not endemic, and have advocated compulsory notification of the disease and various control measures all of which are already in operation in this country.

Mr. N. Macpherson (July 3rd) asked the Minister of Agriculture whether he will make a further statement on the success of measures taken to deal with foot-and-mouth disease in the South-West of Scotland; and if he will state the number of cattle, sheep and pigs, respectively, slaughtered in each of the three counties since the recent outbreak of the disease.

Sir T. Dugdale: The only part of South-West Scotland in which foot-and-mouth disease is now active is the Dumfries infected area, which includes a small part of Kirkcudbright and Cumberland. There have been 42 outbreaks of disease in this area since June 2nd, and 46 in the whole of South-West Scotland, including the Dumfries area, since May 13th. My veterinary officers are confident that the situation in this area is under control though owing to delay in reporting existence of disease in one or two cases some further outbreaks must be expected.

Since the present series of outbreaks began in South-West Scotland on May 13th, 3,272 cattle, 5,166 sheep and 1,027 pigs have been slaughtered in Dumfriesshire; 302 cattle, 201 sheep and 177 pigs in Kirkcudbrightshire; and 494 cattle, 562 sheep and 32 pigs in Wigtownshire.

Sir R. Glyn (July 3rd) asked the Minister of Agriculture (1) if he is satisfied that Veterinary Officers, and their subordinates, who are engaged in the slaughter policy concerned with foot-and-mouth disease, and who can visit any farm at any time, and without notice, subject themselves and their vehicles to thorough disinfection and thus prevent any risk of spreading infection; (2) whether he will ensure that every person authorised by his Department to inspect farms, in areas where foot-and-mouth disease outbreaks have taken place, should bear some official pass so that occupiers of holdings may have some assurance that unauthorised persons do not have access to herds and other animals showing no symptoms of disease; (3) what precautions are taken when slaughterers are employed by a contractor to kill non-contact animals on a farm infected by foot-and-mouth disease to ensure that after the work is completed they do not carry infection elsewhere.

Sir T. Dugdale: The Foot-and-Mouth Disease Order provides that any person (including a Veterinary Officer) entering any place in which a diseased or suspected animal is or has been recently kept, shall wear suitable overall clothing and boots which are capable of being disinfected, and shall, before leaving the place, thoroughly cleanse and disinfect the clothing and boots, and also his hands. This rule is scrupulously observed by my inspectors and they or the police supervise the disinfection of other persons, including slaughtermen who are brought on to farms infected with foot-and-mouth disease to slaughter any animals. The tools and tackle of slaughtermen are also disinfected. When visiting other farms in connection with foot-and-mouth disease duties, my inspectors wear protective clothing which is thoroughly disinfected both before going on to the farm and on leaving. As a further precaution, inspectors with duties on an infected place do not visit other farms, save in exceptional circumstances.

The only vehicles allowed to go to an infected place are those which are essential in connection with slaughtering, and these are not allowed to leave until they have been disinfected under the supervision of a Veterinary Officer.

All officers of my Department who inspect farms in connection with foot-and-mouth disease carry a certificate authorising them to inspect animals and poultry. Visits by officers for purposes other than the control of animal diseases are reduced to a minimum in infected areas.

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Slaughtering of Animals (Compulsory Orders)

Lieut.-Colonel Bromley-Davenport (July 4th) asked the Minister of Agriculture what steps are taken in connection with the compulsory slaughter of animals involved in outbreaks of foot-and-mouth disease to ensure that it is carried out under the most humane conditions possible; and whether it is the normal practice for his officers to invite or permit the co-operation of inspectors of the Royal Society for the Prevention of Cruelty to Animals.

Sir T. Dugdale: The instructions which are issued to every member of the veterinary staff of my Department set out in detail the procedure to be followed when orders are given for the slaughter of animals as a result of outbreaks of foot-and-mouth disease.

I am satisfied that the procedure (which, among other things, requires that competent slaughtermen, butchers or knackers shall be employed) provides for slaughter under the most humane conditions possible. It is not the normal practice to invite the co-operation of inspectors of the Royal Society for the Prevention of Cruelty to Animals, but they have on occasions been asked to be present when the slaughtering was being carried out.

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Horses (Retention on Farms)

Mr. Renton (July 3rd) asked the Minister of Agriculture how many horses were working on farms in England and Wales in 1938 compared with the latest date for which figures are available; and what steps he is taking to ensure that enough horses are retained at work on the farms to prevent farming from being brought to a standstill in the event of a serious shortage of petrol.

Sir T. Dugdale: The number of horses used for agricultural purposes in England and Wales was 562,000 in June, 1938, and 222,000 in December, 1951. My Department encourages the maintenance of a breeding stock of heavy horses by giving grants to societies travelling stallions, but it would be impracticable to ensure that enough horses were retained on farms to provide for every emergency.

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Irish Horses (Import)

Mr. E. Johnson (July 3rd) asked the President of the Board of Trade if he will arrange for the Trade Returns to distinguish between the number of horses imported from Ireland for food and for other purposes.

Mr. P. Thorneycroft: No, Sir. The volume of imports of horses for food is insufficient to justify raising a separate statistical heading for that class.

Mr. Johnson: Would not my right hon. Friend agree that one of the first steps to be taken to prevent the illicit slaughtering of horses under disgusting circumstances should be at least to know how many are imported from Ireland and for what specific purposes they are imported?

Mr. Thorneycroft: The total value of animals imported for food amounted only to £23,172 from January to May this year for all types of animals, and so I am afraid that the total for horses, if it were separated, would be extremely small and not of very great value to my hon. Friend.

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ROYAL COLLEGE OF VETERINARY SURGEONS

Membership Examinations, June-July, 1952

List of Successful Candidates

London

Second Examination

Physiology only

Beddows, A. C. L.
Booker, J. C.
Cansfield, C. J.
Cullen, C. S.
Fenton, B. K.
Hardwick, A. G.
Jones, T. H.
Kearns, M. P.
Keeling, M. D.
Norman, D. A.
Pigott, R. C. C.
Simons, M. A. P.
Skipsey, Roger
Thomas, C. J.

Anatomy (including Histology)

Baxter, C. J.
Bedson, I. F.
Bowles, Jeffrey
Cameron, R. S.
Coryn, H. D.
De Marigny, M. J. C. D.
Derbyshire, J. B. (credit)
Dier, B. G. F.
Down, R. C.
Evans, E. D.
Fairhall, D. C.
Finn, C. A.
Gray, C. G.
Gray, John
Heptinstall, J.
Hudson, J. R.
Hyde, Miss K. B.
Kerry, J. B.
Lifton, J. M.
Markham, K.
Melluish, H. K.
Millar, J. A.
Morath, D. E.
Naylor, D. C.
Owen, G.
Parkinson, K. D.
Peters, J. B.
Pocock, E. W.
Prole, J. H. B.
Rawson-Shaw, Miss E. A.
Shrimpton, D. F.
Stevens, H. R.
Strang, R. D.
Taylor, E. L. G.
Thorp, A. C. B.
Townsend, Miles
Wall, L. J. T.
Ward, Anthony (credit)
Watson, Miss D. P.
Whitaker, D. L.
White, Frederick
Williamson, D. C.
Wilson, Miss E. D. (credit)
Woollett, W. G. W. A.
Wright, M. A.

Third Examination

Hygiene only

Basinger, D. (credit)
Dommett, D. J.
Douch, J. A.
Downes, J. E.
Eden, R. M. G.
Fry, N. C. V.
Gillett, T. G. F.
Hambrook, C. L. E.
Hawkins, Albert
Keep, M. E.
Mackay, B. H. P.
Morgan, D. B.
Nelson, D. G.
Shaw, D. L. (credit)
Stockwell, G. D.
Taffs, L. F.
Tuckey, J. B.
Williams, J. R. L.

Pathology only

Anderson, D. C.
Ashgar, S.
Barley, A. P.
Berry, D. M.
Biggs, P. M. (credit)
Bloomberg, J. H.
Box, P. G.
Carter, H. E.
Carter, J. B.
Clay, Daniel
Dickens, P. S. E. M.
Evans, J. M. (credit)
Fell, B. F. (credit)
French, P. J.
Freudenthal, G.
Govaerts, L. V.
Hall, S. A.
Haxby, D. L.
Hooker, Miss P. M. W.
Jones, M. D. B.
Jordan, A. N.
Keywood, E. K.
Kirby, M. A.
Lane, D. R. (credit)
Larkin, P. J.
Malone, J. C.
Manton, V. J. A.
Martin, H. T. W.
Menard, F. R. J. R.
Morris, A. D.
Neal, N. W.
Pepper, R. T.
Rabbich, P. D.
Reid, J. H. (credit)
Richards, M. A.
Rodgers, M. J.
Russell, G. P.
Smith, G. R. (credit)
Smith, P. L. F.
Stear, R. T. (credit)
Tew, N. C.
Thomas, J. L.
Townsend, G. H.
Tucker, Miss J. W.
Walker, Miss G. M. (credit)
Walter, W. H.
Whitaker, G. L.

Final Examination

Ayliffe, J. H.
Bennett, P. H. G.
Blyth, A. M.
Bouvet, Roger
Brunsdon, J. R.
Bunting, Miss J. A.
Clark, J. H.
*Cook, W. R.
Dent, H. H.
Downie, N. F.
Evans, H. L.
Garland, Miss Mary
Haggis, I. H.
Hay, I. F. S.
Jack, J. A. G.
James, T. M.
Jones, W. G.
Laing, P. W.
Marston, J. R. T.
Moore, D. W. W.
Napier, Miss E. E. W.
Needham, N. S.
Newbery, M. J. E.
Norman, J. A.
Orfeur, N. B.
Payne, J. M.
Piatkowsky, E. L.
Pillai, C. P.
Polley, M. J.
Robinson, J. S.
Sherwood, J. E. T.
Shipley, Wm.
Silver, I. A.
Skinner, D. J.
Swift, G. A.
Tinsley, Miss P. E.
Wallace, H. G.
Wheeler, J. M.
Wiggins, G. S.
Wiltshire, L. V.
*Wood, K. H. B.

* Denotes Second-class Honours.

(*To be continued*)

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GRANTS FOR COLONIAL DEVELOPMENT AND WELFARE

Money issued for approved schemes under the Colonial Development and Welfare Acts totalled £56,346,571 in the six years ended last March, states the annual return of schemes made under the Colonial Development and Welfare Acts by the Secretary of State for the Colonies, published on July 2nd by the Stationery Office as a White Paper, price 1s. 6d.

Last year's total of £14,470,682 was the largest sum paid out in any one year of the six under review. Of this total, £13,293,237 was for development and welfare and the remaining million was for research. New grants for development were made during the year to the total of £16,003,304, some £2,000,000 of which is allocated for water supplies, £3,000,000 for education, £2,000,000 for agriculture, and £2,750,000 for communications. Of the £861,851 granted for research, £373,826 is for agriculture and £136,803 for medicine.

Large sums have been provided for the West Africa territories; £150,000 for road developments in The Cameroons, which is under British Trusteeship; £52,234 for University College, Ibadan; £43,163 for animal husbandry in Sierra Leone; £41,740 for health centres at York and Waterloo in the same territory; and £1,049,832 towards the cost of agricultural development in Nigeria.

East Africa receives £202,500 for Makerere College to provide for staff housing, an arts block, and materials for other buildings, and £150,000 for a technical college at Nairobi to serve all East African territories. The present plans for this college are based on an ultimate growth of this college to 1,500 full-time and 1,000 part-time students. Also £200,000 has been given for development and research funds for land reclamation schemes in Kenya, Uganda, and Tanganyika undertaken by the East African tsetse and trypanosomiasis research and reclamation organisation.

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Mr. C. S. Webb, until recently curator of mammals and birds at the London Zoo, has been appointed superintendent of the Dublin Zoological Gardens in succession to the late Mr. Cedric Flood.

NOTES AND NEWS

Diary of Events

July 17th.—Meeting of the East Midlands Division, B.V.A., at Sutton Bonington, 2.15 p.m.

July 18th.—Summer Meeting of the Royal Counties Division, B.V.A., at Weybridge (see Notice).

July 18th.—Meeting of the South Wales Division, B.V.A., at Carmarthen (Dolwar Café), 2.15 p.m.

July 25th.—Summer Meeting of the Mid-West Division, B.V.A., at Wells (Small Hall, Market Place), 2.30 p.m.

July 25th.—Meeting of the Association of Veterinary Teachers and Research Workers (Southern Region) at the Wellcome Research Station, Frant, nr. Tunbridge Wells, 12 noon.

Sept. 8th—13th.—Seventieth Annual General Meeting and Congress of the British Veterinary Association, at Harrogate.

COUNCIL AND COMMITTEE MEETINGS OF THE B.V.A.

The next quarterly meetings will be held in London on July 21st, 22nd and 23rd, in the following order:—

July 21st.—Monday, 12 noon, Parliamentary and Public Relations Committee; 2.30 p.m., Organising Committee.

July 22nd.—Tuesday, 10 a.m., Veterinary State Medicine Committee; 12 noon, Home Appointments Committee; 2 p.m., General Purposes and Finance Committee.

July 23rd.—Wednesday, 11 a.m., Council Meeting.

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H.M. The Queen as Patron of the British Veterinary Association

We are privileged to announce the receipt of an intimation from the Keeper of the Privy Purse that Her Majesty Queen Elizabeth has been graciously pleased to grant her Patronage to the British Veterinary Association.

The renewal of Royal Patronage at the highest level is of considerable significance as touching the dignity and prestige of the Association, and this welcome announcement therefore will be received with supreme gratification by all our members. It is of interest to recall that the tangible expression of Patronage was first given to the long-standing appreciation by the Royal House of the work of the veterinary profession, in the year 1929, when under President O. Charnock Bradley and (to quote him) "thanks to the kind offices of Sir John Moore," H.R.H. the Prince of Wales, later King Edward VIII, became Patron. As we know, many of his outdoor enthusiasms, such as make a special appeal to members of our profession, were shared to the full by his brother, the late King George VI—that successor of great qualities and high ideals—and a continuing interest both in those activities and in the profession which safeguards the health of the animal population of the Realm now receives renewed manifestation at the hands of Her Majesty Queen Elizabeth II.

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Castration and Docking

As intimated previously, the Technical Development Committee, which has under consideration the subjects of castration and/or docking of lambs and the castration of calves, is anxious to obtain views from members of the profession on various procedures.

Details are required, particularly, concerning the use of rubber ligatures for these purposes, and also for the docking of puppies. The Committee would be grateful if members interested would send in to the General Secretary a note of their experiences of methods of application and materials used, of their opinions in respect of the pain factor, and of the period taken to obtain the final result. It would also be useful if observations upon the sequelae, favourable or otherwise, could be included.

PERSONAL

DOCTORATES IN THE UNIVERSITY OF EDINBURGH

At the graduation ceremony on July 3rd, 1952, the following degrees were conferred by the University of Edinburgh:—

Doctor of Science in the Department of Veterinary Science:

Stamp, John Trevor, B.SC., M.R.C.V.S., Veterinary Investigation Officer, Edinburgh and East of Scotland College of Agriculture; Thesis: "Some Aspects of the Pathology and Pathogenesis of Bovine Tuberculosis."

Doctor of Philosophy, in the Faculty of Science:

Moodie, Edwin William, B.SC., M.R.C.V.S., Lecturer, Department of Veterinary Hygiene and Preventive Medicine, Royal Dick School of Veterinary Studies; Thesis: "Blood Changes in the Parturient Bovine."

Thin, Christian Gibson, B.SC. (ST. AND.); Thesis: "A Study of Ketosis in the Ruminant."

Watt, James Allan, B.SC., M.R.C.V.S., Assistant Veterinary Investigation Officer, Edinburgh and East of Scotland College of Agriculture; Thesis: "The Bacteriology of a Pustular Dermatitis of sheep on the Scottish Border."

Drs. Stamp, Moodie and Watt are all past students of the Edinburgh Veterinary School; Miss Thin's research work was done in the Department of Veterinary Hygiene of the School.

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DR. MICHAEL CRONIN'S POST IN THE U.S.A.

Dr. Michael T. I. Cronin, M.R.C.V.S., who is aged 28 and is the eldest son of Dr. T. W. Cronin, Ballyrobert Castle, Castlelyons, Co. Cork, has been appointed Director of the Regional Laboratory, Warrenton, Virginia, U.S.A., which has recently been established for services to bloodstock in the centre of a noted thoroughbred rearing country.

Dr. Cronin, who qualified from the Dublin College in 1945, and later secured his M.Sc. and Ph.D. degrees at Dublin University, was engaged for some time with the Medical Research Council of Ireland, after which he joined the staff of the Irish Racing Board. He has spent the last three years on the staff of the Animal Health Trust's Equine Research Station at Newmarket.

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DR. SPRENT'S APPOINTMENT IN THE QUEENSLAND VETERINARY SCHOOL

The appointment is announced of Dr. J. F. A. Sprent, M.R.C.V.S., B.SC., PH.D., to the post of Senior Lecturer in Veterinary Parasitology at the Queensland Veterinary School. Dr. Sprent obtained his M.R.C.V.S. at the Royal Veterinary College in 1939, gaining the Coleman Silver Medal in Veterinary Medicine and the Gold Medal in Pathology. He proceeded to the B.Sc. degree with first-class honours at the University of London in 1943. He joined the Colonial Veterinary Service and was stationed for two years at the Veterinary Laboratory at Vom, Nigeria. Work undertaken at this period in helminthiasis in Zebu cattle, with special reference to hookworm disease, continued subsequently at the Veterinary Laboratory, Weybridge, led to the award of the Ph.D. of the University of London in 1945. Dr. Sprent was awarded the Cooper Centenary Research Fellowship by the Veterinary Educational Trust in 1945 and worked under Dr. E. L. Taylor at Weybridge; after obtaining a University of London Travelling Studentship in 1946, he worked in the Departments of Bacteriology and Parasitology at the University of Chicago. He was awarded the Research Fellowship in Preventive Medicine by that University in 1947 and in 1948 was appointed a Senior Research Fellow at the Ontario Research Foundation, Toronto.

His research at Toronto during the past five years has been mainly concerned with the host parasite relationship, having particular reference to ascaris infection.

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Other Appointments.—The Colonial Office announces the appointment in the Colonial Veterinary Service of Mr. P. J. Byrne, M.R.C.V.S., as Veterinary Officer, Tanganyika.

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Announcement is also made that Mr. J. D. M. Jack, M.R.C.V.S., has been promoted to the post of Deputy Director of the Sudan Veterinary Service.

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Birth.—MERCER.—On June 10th, 1952, to Diana, wife of P. H. Mercer, M.R.C.V.S., of 55, Thorpe Park Road, Peterborough, a daughter—Susan Michele.

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Marriage.—HUTCHINGS—JENNER.—On June 7th, 1952, at Fingest Church, Bucks, Donald A. Hutchings, M.R.C.V.S., to Vivien Jenner. Gordon Shattock, M.R.C.V.S., was best man.

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Will.—Mr. John Wright Conchie, F.R.C.V.S., of 30, Comberton Hill, Kidderminster, who died on March 5th last, aged 75, left £2,869 13s. 5d. gross; £2,843 1s. 5d. net.

Mr. F. J. Milne's Doctorate.—At the Commencement Exercises held on June 6th, 1952, Mr. Francis James Milne, M.R.C.V.S., Assistant Professor of Surgery, graduated D.V.M. from the School of Veterinary Medicine, Colorado Agricultural and Mechanical College. Dr. Milne qualified at the Edinburgh Veterinary School in 1938.

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R.C.V.S. OBITUARY

Good, Henry William, Kilpatrick Lodge, Scalby, Scarborough, Yorks. Graduated London, July 17th, 1909. Died July 1st, 1952; aged 65 years.

Mr. H. W. Good, M.R.C.V.S.

We record above, with deep regret, the death of Mr. Henry William Good, M.R.C.V.S., who for more than 40 years was Veterinary Surgeon to Scarborough Corporation until he retired six months ago.

Mr. Good qualified in 1909 and set up in business at Scarborough a year later. In 1943 he went into partnership with Mr. A. J. E. Johnstone, and members of our Association who attended the Scarborough Congress of 1936 will recall how deeply indebted was the (then) N.V.M.A. to both Mr. Good and Mr. Johnstone for arranging with the Corporation for the provision and equipment of three operating theatres at the Dean's Road premises for the splendid series of operations and demonstrations, which included the historic demonstration by Professor Nils Lagerlöf, of Stockholm, on sterility in bulls.

Mr. Good was a Veterinary Inspector for the Ministry of Agriculture for many years and held many other appointments, including that of referee in licensing disputes.

Mr. Good, whose wife died some time ago, leaves a son and daughter, another son having been reported missing, believed killed, in the Navy during the last war.

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Foot-and-Mouth Disease

Sir Thomas Dugdale, Minister of Agriculture, in an address at Ashford, Kent, on July 1st, referred to the forthcoming visit of Sir Thomas Dalling, until recently Chief Veterinary Officer to the Ministry of Agriculture, to the International Food and Agriculture Organisation in Rome. He said that the conference might start something very important in dealing with the disease in Europe. Records showed that the disease was slowly contracting in the Midlands. 'In the country as a whole we are winning the battle," the Minister said.

During the first half of the past week fresh outbreaks of foot-and-mouth disease have been confirmed in Cumberland, Dumfriesshire, Kent and Oxfordshire, bringing the total number to 512 since last November and the animals slaughtered to 31,027 cattle, 24,525 sheep, 11,009 pigs and 57 goats. The amount paid in compensation for the first 476 outbreaks is £2,229,913.

The Anglesey Agricultural Society's show, which has been held annually at Llangefni for 67 years, will not be held next month because of foot-and-mouth disease, and for the same reason the Matlock and District Agricultural Society has abandoned its show, which was to have been held on September 6th.

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Eradication of Tuberculosis from Danish Herds

Reporting on recent celebrations—including a state luncheon and speeches in Parliament—in Copenhagen, Reuter's correspondent states that Denmark can now guarantee that every drop of milk and every ounce of butter and cheese sold to the public are the produce of healthy cows, completely free from bovine tuberculosis. The Danish Ministry of Agriculture point out that this position has been achieved only after years of painstaking and persistent effort by the whole Danish farming industry under the advice of bacteriologists and veterinary experts.

So far as is known, bovine tuberculosis first appeared in Denmark about a century ago. It gradually spread over the whole country. Lack of knowledge of its true nature contributed to its extension, and it was not until the close of the last century that a sustained effort was made to fight the scourge.

At first the fight was carried on locally and on a voluntary basis, but gradually it was intensified and organised so that the whole Danish farming industry, backed by scientific and veterinary authorities and by legislation, combined in a great campaign to eradicate the disease in Denmark.

In 1898 a law was passed requiring the slaughter of all cows suffering from tuberculosis of the udder. The same law decreed that all milk returned by dairies to the farmers should be pasteurised before being used as animal food.

Before 1932 the number of tuberculin-tested herds in Denmark was fewer than 1,000. During that year it reached nearly 2,500, although even this figure was small considering that there were about 200,000 herds in the country.

The next steps were the opening of a register of attested herds by the Federation of Danish Dairy Associations, and the ruling of the Ministry of Agriculture that as soon as 90 per cent. of the herds in any area were free from tuberculosis the remaining herds must be subjected to compulsory tuberculin testing and all infected cows destroyed. During the period from November, 1934, to May, 1951, 318,000 infected cows were slaughtered under this provision.

Even during the war the campaign was relentlessly pursued. Between 1940, when Denmark was occupied by the Germans, and 1945 the percentage of herds completely free from tuberculosis increased from 25·4 to 84·7.

A potent factor in the campaign was that after April, 1943, the owners of unattested herds were paid lower prices for their milk. Then, late in May, 1952, the Ministry of Agriculture issued an order stating that dairies entitled to use the national trade mark for butter and cheese might receive their milk only from herds which were completely free from tuberculosis. This regulation came into force on June 1st, a date of historic importance for the Danish dairy industry because it set the official seal on the victory over bovine tuberculosis in Denmark—a triumph upon which British veterinarians will congratulate their Danish colleagues whole-heartedly.

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TRANSPORT OF HORSES BY SEA

The Minister of Agriculture and Fisheries has made an Order entitled "The Horses (Sea Transport) Order, 1952," to regulate the carriage of horses by sea both into and from Great Britain.

The Order re-enacts with minor amendments the provisions of previous Orders relating to the carriage of horses by sea from ports in Great Britain, and extends those provisions to horses in transit to Great Britain. It makes detailed provisions about the construction and fittings of vessels used for the carriage of horses and the method of carrying these animals and provides for their care, including feeding and watering, both on the voyage and on landing.

The Order comes into operation on September 1st, except for two articles, relating to the fittings of vessels, which come into operation on January 1st, 1953.

Copies of the Order may be obtained from H.M. Stationery Office or from the Ministry of Agriculture and Fisheries, Hook Rise, Tolworth, Surbiton, Surrey.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

ANTHRAX:

Essex.—Gatehouse Farm, Middleton (July 2nd).

Glos.—Kilkenny Farm, Bibury, Cirencester (June 27th); Eastleach, Lechlade (July 1st).

Lancs.—Spen Farm, Clifton Road, Marton, Blackpool (July 2nd).

Northants.—Glebe Farm, Woodford, Kettering (July 1st).

Somersetshire.—Manor Farm, Ditcheat, Shepton Mallet (July 1st).

Staffs.—Clifford Wood Farm, Synnerton, Stone (June 27th).

Suffolk (W.).—Street Farm, Brent Eleigh, Sudbury (June 27th).

Surrey.—Ashley Court Farm, Ashtead Woods, Ashtead (July 1st).

FOOT-AND-MOUTH DISEASE:

Cumberland.—Greymoor Hill Farm, Kingstown, Carlisle (July 1st); Red Kirk No. 3, Gretna, Carlisle (July 2nd).

Devon.—Middle Woodbeer Farm, Plymtree, Collompton (July 3rd).

Cheshire.—Hatherton Farm, Hatherton, Nantwich (July 3rd).

Dumfriesshire.—Collochan and Prospect Hall, Terregles, Dumfries (June 28th); Castle Hill Farm, Dryesdale; Nethercleugh, Lockerbie; Grahams Hall, Ecclefechan; Mill Hill Farm, Castle Douglas Road, Dumfries (June 29th); Briery Hill Farm, Applegarth, Lockerbie.

Kent.—Frogbrook Farm, Wye, Ashford (July 3rd).

Sussex (E.).—Thanets, and Mock Beggar, Playden, Rye (June 28th); Mount Pleasant Farm, Guestling, Hastings (June 29th); The Sewage Works, Hailsham (June 30th).

SWINE FEVER:

Derbyshire.—Lydgate Farm, Wingerworth, Chesterfield (July 2nd); 98, Nottingham Road, Somercotes (July 3rd); Poolsbrook Farm, Poolsbrook, Chesterfield (July 4th).

Glos.—103, Estcourt Road, Gloucester; Crow Ash Farm, Coleford (July 2nd).

Herts.—Home Farm, Albury Hall, Albury (July 3rd).
Lancs.—Wrainhow House, Lewth Lane, Woodplumpton, Preston (July 2nd); Carmont Nurseries, St. James Road, Southshore (July 3rd); Greenfield Farm, Goosnargh (July 4th).
Midlothian.—Humbie Farm, Kirknewton (July 3rd).
Notts.—Allotment Gardens, Newgate Lane, Mansfield (July 4th).

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First Asian Regional Conference of Epizootic Diseases

During the 19th session of the *Office international des Epizooties* held in Paris in May, 1951, a Regional Commission for Asia was appointed. The task of the Commission was "to review, co-ordinate and recommend ways and means for effecting a closer co-operation and co-ordination of work on animal disease control and research in South and South-East Asia." Pakistan accepted the duty of acting as host to the first conference, which was held in Karachi from May 3rd to 9th, 1952. The main work of the conference was to frame a number of resolutions, briefly summarised below, which it is gathered have now been approved by the Paris Office.

[The appointment of this Commission will, it is hoped, reinforce the work of the Paris Office. It may be recalled that at the end of 1945 a conference met in Sydney, New South Wales, to consider the setting-up of a similar organisation for the Pacific area. This aim, however, was not achieved.]

Representation at the Karachi Conference was sought from the following countries: Afghanistan, Burma, Cambodia, Ceylon, China, India, Indonesia, Japan, Laos, Malaya (Federation States), Pakistan, Philippines, Singapore, U.S.S.R., and Vietnam. The Paris Office and the World Health Organisation and the Food and Agriculture Organisation of the United Nations were also represented. Representatives attending the Conference were presented with an illustrated booklet giving many interesting details of Pakistan and particularly of its rural economy.

The Karachi Conference was fittingly opened by the Pakistan Food and Agriculture Minister. The Minister in his speech referred to the necessity for building up on a scientific basis a healthy, efficient and therefore economic livestock industry as a means of promoting human happiness and a higher standard of living. For this, he pointed out, there must be a long-term policy, based on mutual assistance and the utilisation of the best technical knowledge available. Referring to schemes in execution or proposed towards this end in Pakistan, the Minister mentioned in particular the control of rinderpest, liver fluke, haemorrhagic septicaemia, and foot-and-mouth disease, and he also stressed the need for improving the quality of exported animal products like hides, skins, wool, etc. The development and manufacture of biological products in large quantities at reasonable cost demands urgent attention. The Minister concluded with a reference to the research organisations that have been set up under central and provincial control in West and East Pakistan, and to the Government farms now at work on the improvement of cattle and other livestock.

The resolutions passed by the Conference were as follow:—

1. A permanent Committee in Asia, to be sponsored by the Paris Office, should be set up to advise the various countries on epizootic diseases, the Committee to consist of representatives from member and non-member countries of the Paris Office and of the F.A.O., with the Director of the Regional Bureau of the Paris Office as Secretary.

2. A bulletin on standardised lines, showing monthly and annual occurrence of epizootic diseases should be prepared for exchange between neighbouring countries, the information published in the bulletin to be consolidated at intervals by the Regional Bureau.

3. Movement of livestock between countries should be restricted to agreed routes and under veterinary control.

4. Immune belts should be established against disease liable to spread from one country to another.

5. All Asian countries should submit to the Paris Office copies of the veterinary regulations relating to epizootic diseases that are at present in force, the Paris Office to be asked to prepare for the next Asian Conference model regulations intended to serve as a future guide to those countries.

6. Separate commissions should be appointed (*a*) to co-ordinate laboratory and field work on rinderpest and to effect the necessary liaison with any other organisations concerned with this disease, (*b*) to stimulate and co-ordinate research work on pasteurellosis with a view to obtaining more efficient vaccines and to studying climatic and geographical factors concerned with this disease.

7. An international centre for foot-and-mouth disease research should be set up in Asia.

F. C. M.

HUNTERS AT SHREWSBURY: MAJOR TOWNSEND'S SUCCESS

In its report of the show held by the Hunters' Improvement and Light Horse Breeding Society at Shrewsbury, *Horse and Hound* (July 5th) states that it was considered that the Society had not staged such a good show "since the good old days at Islington, the last show being held there in 1939. . . . After luncheon came the class for brood mares and foals—and what a class it was this year! Twenty-four appeared, all mares of quality and right type.

"A grand chestnut, 'Stanton Dale' by Hakim out of a mare by 'Poor Man' and owned by one of the Society's Veterinary Surgeons, Major C. W. Townsend, stood at the top with such mares as Mrs. Lucas's 'Sarah Jinks,' Mr. Walter Bishop's 'Night Club,' Mr. Roberts's 'Visuality' and Mr. F. H. Davies's 'Sweet Orange,' filling the remaining places. . . . Stanton Dale's foal was placed fourth."

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CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

SCHISTOSOMUS REFLEXUS AS TWIN TO NORMAL CALF

Sir,—I was very interested to read Mr. P. R. Greenough's contribution in *The Veterinary Record* of June 28th. This prompts me to forward the following case record:—

A third calf Friesian cow gave birth to a dead heifer calf (posterior presentation) about three weeks prematurely. The animal appeared quite normal for a couple of days, whereupon she showed vague symptoms of dullness and was seen to be forcing periodically. This state of affairs continued for a week when, the forcing becoming more violent, the farmer decided to examine her and found she had another calf.

I visited the animal that day and examination *per vaginam* revealed the presence of a *Schistosomus reflexus*—the "monster" presenting with its head and all four legs anterior (one front leg was just a vestige), enveloped in a sac of skin, the viscera lying in the vagina. Steady traction by means of a hook in the "blunt" end of the schistosome was enough to deliver it in about 10 minutes.

It is interesting to note that even though the first calf had been born nearly a week previously, there was no sign of emphysema in the second "calf" and delivery was quite easy.

I would be pleased to know if there are any records of a similar case of a *Schistosomus reflexus* born as a twin to an apparently normally developed calf.

The dam has calved normally on two occasions (both bull calves). Her grand-dam was a Shorthorn and her dam a first cross Friesian.

The sire of these calves is a pedigree Friesian bull.—Yours faithfully, Eric I. Williams, Minyfford, St. Clears, Carmarthen. *July 7th*, 1952.

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THAT SLANG TERM—"VET."

Sir,—Of late there seems to be a plethora of the use of the term "Vet." both by the spoken word across the ether and in the written word in the secular Press.

Recently a female broadcaster stated she had to call in a "Vet." to treat her sick dog and at a more recent date the B.B.C. broadcast the technique adopted in an outbreak of foot-and-mouth disease and the veterinary surgeon in attendance was meticulously branded throughout as "The Vet."

So much for that autocratic if none too cultured body, the B.B.C.; its contemporary the secular Press is not far behind, for recently I noted with disgust in a daily provincial paper, on the front page and in bold type, "University Degrees for 2 Eminent Vets." If this is not a misnomer, well, what is a misnomer? I, for one, look upon the term "Vet." as being on the plane with "quack" and I have never heard of an *eminent* quack. I am quite sure the two distinguished veterinary surgeons concerned would greatly resent being branded as eminent "Vets."

But I fear not a few of our own ilk glory in the use of the vulgarism, this being brought home to me some time ago by a student passing through this town who called to see me and I noted with regret the word "Vet." slipped off his tongue with an easy freedom. I could not be rude to him while under my roof, but I did hint to him that the walls of my library were unaccustomed to such unwholesome rebounds.

While on this subject, it may not be out of place to suggest we might make an effort to clean up our own "Augean Stable." Scattered throughout our own literature we come across the term, time and again, presumably for condensation purposes; then why not replace it by the word "Veterinary."—a more refined expression.—Yours faithfully, W. M. Scott, Fryern Hall, Bridgwater, Somerset. *July 6th*, 1952.